CHAPTER 3

METHODOLOGY

3.1 PROJECT METHODOLOGY

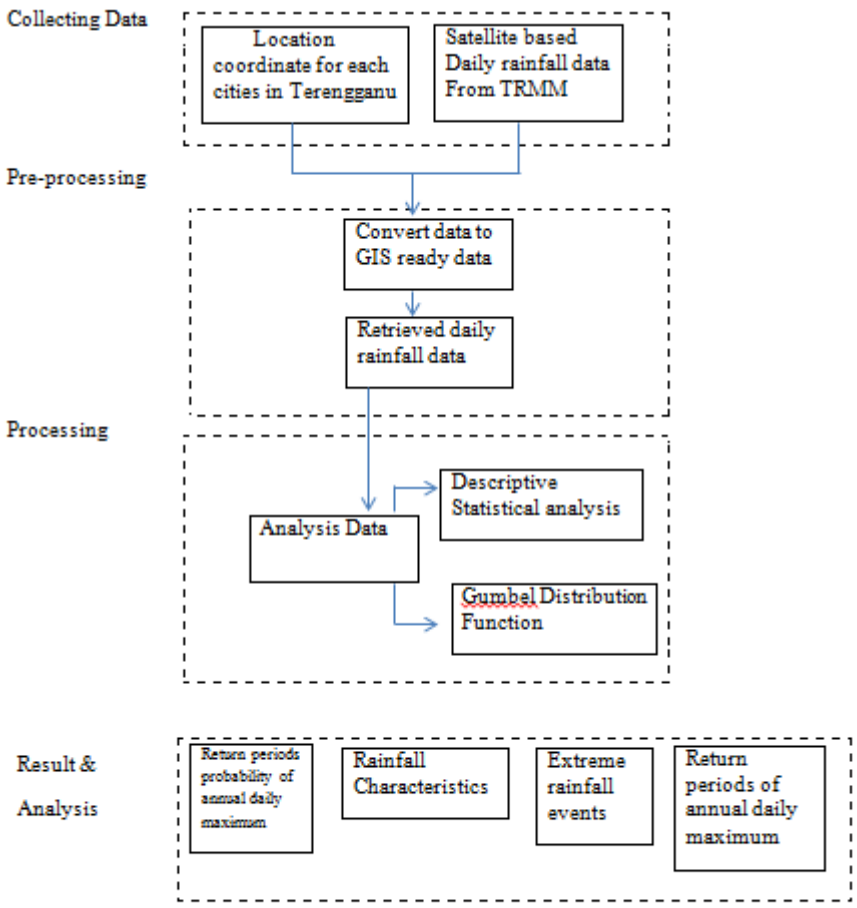

Figure 3.1 : Flow Chart of project methodology

3.2 HYDRO CLIMATOLOGY

The term weather refers to the condition of the atmosphere at any particular time and place. Weather is always changing. The climate of a particular region is the composite of weather characteristics over many years. Climate reflects weather variations, including extremes as well as averages, Elements of weather and climate include precipitation, wind, temperature, humidity, air pressure and clouds. (Suhaila, 2014). The factors that produce weather and climate in any given location include:

(a) Altitude
(b) Prevailing winds
(c) Ocean currents
(d) Mountain barriers
(e) Distribution of land and water bodies
(f) Region of high and low atmospheric pressure

3.3 MEASUREMENT OF RAINFALL

3.3.1 Tropical Rainfall Measuring Mission (TRMM)

Daily rainfall data of major cities in Terengganu (Kemaman, Dungun, Marang, Hulu Terengganu, Kuala Terengganu, Setiu and Besut) were collected from Tropical Rainfall Measuring Mission (TRMM) satellite base rainfall from public domain. For TRMM observatory and instruments, GSFC designed, built and tested the observatory "in house" at its Greenbelt, Md., facility. At launch, the observatory weighed 7,920 lbs. (3,600 kg). It is about 17 feet tall (approximately 5 meters) and 12 feet (3.6 meters) in diameter. A gallium arsenide solar array/nickel cadmium battery power subsystem provides 1,100 watts of load power to the satellite. (Rui, Earth Observatory).

The TRMM Microwave Imager (TMI) is a multi-channel radiometer, whose signals in combination can measure rainfall quite accurately over oceans and somewhat less accurately over the land. The TMI and PR data, will yield the primary precipitation data sets. (Rui, Earth Observatory).

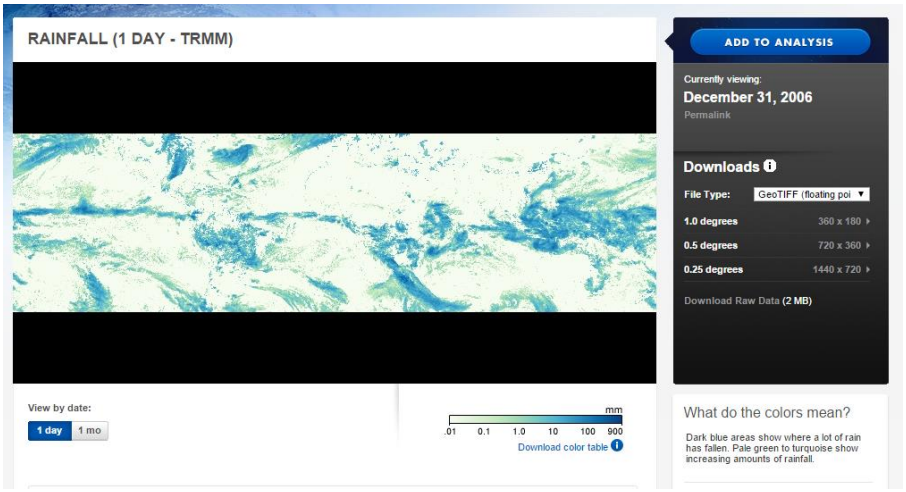

Figure 3.2 : Webpage TRMM data

3.3.2 Descriptive Statistics

Descriptive statistical analysis for three types of data: i) annual rainfall, ii) annual daily maximum rainfall and iii) annual monthly maximum rainfall. Descriptive statistics deals with organization and summary of large scale data. It includes tables, graphs and numbers to present raw data (Ott and Longnecker, 2010). We applied descriptive statistics to rainfall data to examine its central tendency (mean, median and mode), variability (standard deviation), symmetry (skewness) and peakedness (kurtosis). (Ahammed, 2014)The various statistical moments used in this study are given below:

First moment (mean):

$$\bar{y} = \frac{\Sigma\, yi}{n}$$

Second moment (variance):

$$S^2 = \frac{\Sigma\,(yi - \bar{y})^2}{n - 1}$$

Third moment (skewness):

$$g = \frac{n\,\Sigma\,(yi - \bar{y})^3}{(n-1)(n-2)s^3}$$

Fourth moment (kurtosis):

$$\gamma_2 = \left[\frac{(\mu 4)}{(\mu 2)^2}\right] - 3$$